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26646 7590 09/11/2007 KENYON & KENYON LLP ONE BROADWAY NEW YORK, NY 10004				
			EXAMINER ANDERSON, DENISE R	
			ART UNIT 1709	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@kenyon.com

**Office Action Summary**

Application No.

10/561,510

Applicant(s)

HOGT ET AL.

Examiner

Denise R. Anderson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>24 Dec. 2005, 11 May 2006</u> | 6) <input type="checkbox"/> Other: _____  |

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5, 7-9 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyashita et al. (US Patent No. 6,325,983 B1, Dec. 4, 2001). The claims appear below in italics with the prior art and examiner's comments in normal font.

*Claim 1. Process for cleaning a filtration membrane by dosing one or more water-soluble peroxide compounds, which are not essentially hydrogen peroxide, to the influx.*

Miyashita et al. discloses a process (a method) for cleaning a filtration membrane (a separating membrane) using a detergent that "includes a percarbonate-containing material, existing in the condition in which hydrogen peroxide is adducted in carbonate and is desirably an alkali metal salt."

Miyashita et al., Abstract, lines 1-5. Miyashita et al. also teaches, "The detergent is dissolved in water prior to use." Miyashita et al., Abstract, lines 14-15.

Miyashita et al. further teaches that the "detergent preferably comprises a percarbonate-containing material, such as peroxocarbonate, which includes peroxomonocarbonate and peroxodicarbonate." Miyashita et al., Column 15, lines 44-47. Thus, Miyashita et al. discloses a process for cleaning a filtration

membrane with a detergent comprising one or more water-soluble peroxide compounds, which are not essentially hydrogen peroxide.

Miyashita et al. also discloses, "During use, the separating membranes are cleaned with a solution comprising a detergent," and, "In the cleaning method according to the present invention, a system for bringing separating membranes to be cleaned and detergent into contact with each other is not specially limited as long as it enables the separating membranes and detergent to contact each other sufficiently." Miyashita et al., Column 15, lines 44-45; Column 16, lines 22-26. This last teaching would include the process of dosing a water-soluble peroxide compound in the influx.

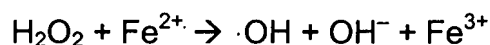
In summary, Miyashita et al. anticipates claim 1.

*Claim 2. Process for cleaning a filtration membrane according to claim 1 wherein furthermore one or more activators and/or one or more reductants are dosed to the influx.*

Miyashita et al. discloses all claim 1 limitations and further teaches both an activator (at least one bivalent iron salt) and a reductant (an acid and a pH regulator). Miyashita et al., Abstract, lines 7-14. With regards to the activator, Miyashita et al. discloses the activator is

" . . . at least one bivalent iron salt, which improves the cleaning capability of the percarbonate via the so-called Fenton's reaction in which the hydrogen

peroxide adducted in the percarbonate reacts with the bivalent iron ions to form  $\cdot\text{OH}$  radicals.



The  $\cdot\text{OH}$  radicals have a very high oxidation reactivity, such as hydrogen extraction reactivity with respect to organisms, and promote the oxidation decomposition of organisms." Miyashita et al., Column 15, line 63 to Column 16, line 6.

In summary, Miyashita et al. discloses adding one or more activators and one or more reductants and, thus, anticipates claim 2.

*Claim 3. Process for cleaning a filtration membrane according to claim 2 wherein the activator comprises a Fe-salt, a Mn-salt, a Cu-salt, a Ni-salt, a Co-salt, or an amine compound, and preferably, said activator comprises a Fe-salt.*

Miyashita et al. anticipates all claim 2 limitations and further teaches the Fenton reaction with the Fe-salt as the activator. Miyashita et al., Column 15, line 63 to Column 16, line 6. Miyashita et al. next states that the "bivalent iron salt used in the detergent may be supplied as any kind of salt, including, for example, in the form of chloride, sulfate, or nitrite." Miyashita et al., Column 16, lines 6-8. In summary, Miyasita et al. anticipates claim 3.

*Claim 5. Process for cleaning a filtration membrane according to claim 1 wherein the peroxide compound is selected from the group consisting of monofunctional*

*peracids, alkali (earth) metal salts of monofunctional peracids, polyfunctional peracids, alkali (earth) metal salts of polyfunctional peracids, organic hydroperoxides, peresters, percarbonates, alkali (earth) metal salts of percarbonates, alkali (earth) metal or ammonium salts of persulfates, and alkali (earth) metal or ammonium salts of perborates.*

Miyashita et al. anticipates all claim 1 limitations and further teaches cleaning the membrane with a detergent comprising a “percarbonate-containing material, such as “peroxomonocarbonate and peroxodicarbonate.” Miyashita et al., Column 15, lines 45-49. Furthermore, the percarbonate could be “an alkali metal salt or an alkali earth metal salt.” Miyashita et al., Column 15, lines 49-53. Thus, Miyashita et al. discloses that the peroxide compound in the membrane cleaning process could be a percarbonate or an alkali (earth) metal salt of a percarbonate – and anticipates claim 5.

*Claim 7. Process for cleaning a filtration membrane according to claim 1 wherein one or more chelating compounds are added to the influx.*

Miyashita et al. anticipates claim 1 and further teaches adding a chelating agent. Miyashita et al., Abstract, lines 12-14. Miyashita also discloses that in “a preferred embodiment, the detergent contains percarbonate, such as sodium percarbonate, and optionally a bivalent iron salt and one or more additives selected from the group consisting of an oxidizer other than hypochlorite and hydrogen peroxide, a surfactant, a chelating agent, and a pH regulator.” Column

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2, lines 59-64. In summary, Miyashita et al. teaches adding one or more chelating compounds and, thus, anticipates claim 7.

*Claim 8. Process for cleaning a filtration membrane according to claim 1 wherein one or more surfactants are added to the influx.*

Miyashita et al. anticipates claim 1 and further teaches adding a surfactant. Miyashita et al., Abstract, lines 12-14. Miyashita also discloses that in “a preferred embodiment, the detergent contains percarbonate, such as sodium percarbonate, and optionally a bivalent iron salt and one or more additives selected from the group consisting of an oxidizer other than hypochlorite and hydrogen peroxide, a surfactant, a chelating agent, and a pH regulator.” Column 2, lines 59-64. In summary, Miyashita et al. teaches adding one or more surfactants and, thus, anticipates claim 8.

*Claim 9. Process for cleaning a filtration membrane according to claim 1 wherein one or more activators, one or more reductants, one or more chelating compounds, and one or more surfactants are added to the influx.*

Miyashita et al. anticipates claim 1. Miyashita et al. also anticipated the addition of one or more activators and reductants as stated in the claim 2 patentability analysis above. Similarly, Miyashita et al. anticipated the addition of one or more chelating compounds and the surfactants, as stated in the claim 7

and claim 8 patentability analyses, respectively. Miyashita et al. anticipates claim 9.

*Claim 12. Process for cleaning a filtration membrane according to claim 1 wherein the membrane is selected from the group consisting of a reverse osmosis membrane, a nanofiltration membrane, an ultrafiltration membrane, a microfiltration membrane, and a particle filtration membrane.*

Miyashita et al. anticipates claim 1 and further teaches that, "Appropriate pore diameters of the separating membranes 113 are not specially limited." Miyashita, et al., Column 5, lines 27-28. "The selected size for the pore diameters generally depends upon the intended application, i.e., the particle diameters of the substance in the object liquid to be subject to the solid-liquid separation."

Miyashita et al., Column 5, lines 35-39. By way of example, the reference discloses that pore diameters could range from 0.001  $\mu\text{m}$  to 0.1  $\mu\text{m}$ , from 0.1  $\mu\text{m}$  to 1  $\mu\text{m}$ , 0.5  $\mu\text{m}$ , or "larger or smaller diameters than those mentioned."

Miyashita et al., Column 5, lines 27-45.

Miyashita et al. discloses a wide range of pore diameters for the filtration membrane and, thus, anticipates a reverse osmosis membrane, a nanofiltration membrane, an ultrafiltration membrane, a microfiltration membrane, and a particle filtration membrane. In summary Miyashita et al. anticipates claim 12.



***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (US Patent No. 6,325,983 B1, Dec. 4, 2001) as applied to claim 2 above, and

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further in view of Jones (Craig W. Jones, "Applications of Hydrogen Peroxide and Derivatives," published by The Royal Society of Chemistry, Cambridge, UK, 1999). The claim is shown below in italics with the prior art or examiner's comments shown in normal font.

*Claim 3. Process for cleaning a filtration membrane according to claim 2 wherein the activator comprises a Fe-salt, a Mn-salt, a Cu-salt, a Ni-salt, a Co-salt, or an amine compound, and preferably, said activator comprises a Fe-salt.*

Miyashita et al. anticipates all claim 2 limitations and further teaches the Fenton reaction with the Fe-salt as the activator. Miyashita et al., Column 15, line 63 to Column 16, line 6. Miyashita et al. next states that the "bivalent iron salt used in the detergent may be supplied as any kind of salt, including, for example, in the form of chloride, sulfate, or nitrite." Miyashita et al., Column 16, lines 6-8. Miyashita et al. does not explicitly disclose the remaining salts or the amine as activators.

Jones, in his second chapter entitled, "Activation of Hydrogen Peroxide Using Inorganic and Organic Species," explicitly teaches that the "hydroxyl radical can also be generated from several one-electron reducing metal ions, of which the most common is iron (II), this combination being known as Fenton's reagent." Jones, page 40, lines 14-16. The examples Jones describes include Mn-salts, Cu-salts, and Co-salts. Jones, Page 46, last line through Page 47, lines 1-8 and lines 27-29; Page 48, lines 4-8. Jones further teaches the formation of a metal oxene species in the presence of hydrogen peroxide that is "classed as a two-

electron transfer oxidation.” Jones, Page 48, Figure 2.16 and lines 14-16. The examples given here include “metalloporphyrins of iron and manganese” and the “manganese systems operate in the presence of a co-catalyst such as imidazole.” And finally, Jones teaches that “a small amount of nitrogenous base with manganese metalloporphyrins greatly increases the stereospecificity of alkene epoxidation.” Jones, Page 48, lines 39-41. One such nitrogenous base that is soluble in water is ammonia, the simplest of the amines.

To summarize the Jones teachings, it is disclosed that the hydroxyl radical can be generated with a one-electron reducing metal ion or a two-electron reducing metal ion, and the latter might include a nitrogenous base. The specific examples cited in Jones include an Fe-salt, a Mn-salt, a Cu-salt, and a Co-salt – and the nitrogenous base might be ammonia, which is both soluble in water and the simplest amine. The missing example is a Ni-salt but is implied by Jones.

According to the Jones teachings above, a water soluble Ni-salt that can function as either a one-electron reducing metal ion or a two-electron reducing metal ion would be a candidate activator for hydrogen peroxide in the Fenton reaction. It would have been obvious to one having ordinary skill in the art at the time the invention was made to clean a filtration membrane with hydrogen peroxide generated during the Fenton reaction and to have substituted the Fe-salt activator of the Miyashita et al. system with the Ni-salt activator as taught by Jones, since Jones states on Page 37, Section 2, lines 3-10, that hydrogen peroxide is a relatively weak oxidizing agent and needs an activator in the

majority of its applications – and having a second activator option would be useful to the Miyashita et al. system for cleaning membranes.

With respect to combining the Miyashita et al. reference with the Jones reference, Miyashita et al. discloses the Fenton reaction as the mechanism by which the hydrogen peroxide works to clean the membrane and the Fe-salts as the activator of choice. Jones teaches the Fenton reaction and the activator characteristics needed to activate the hydrogen peroxide in that reaction. Jones further teaches, explicitly, that the activator might be an Fe-salt, an Mn-salt, a Cu-salt, and a Co-salt and, implicitly, that the activator might be a Ni-salt or an amine. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Miyashita et al. activator in the Fenton hydrogen peroxide reaction, as taught by Jones, since Jones states on Page 37, Section 2, lines 3-10, that hydrogen peroxide is a relatively weak oxidizing agent and needs an activator in the majority of its applications – and having several activator options would be useful to the Miyashita et al. system for cleaning membranes.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (US Patent No. 6,325,983 B1, Dec. 4, 2001) as applied to claim 2 above, and further in view of ACS ("Reagent Chemicals, 10<sup>th</sup> Edition" published by The American Chemical Society, Oxford University Press, 2005). The claim is shown below in italics with the prior art or examiner's comments shown in normal font.

*Claim 4. Process for cleaning a filtration membrane according to claim 2 wherein the reductant is selected from the group consisting of oxalic acid, a (bi)sulfite salt, ascorbic acid, isoascorbic acid, and sodium formaldehyde sulfoxylate.*

Miyashita et al. anticipates all claim 2 limitations and further teaches running the process cleaning reaction with a reductant (pH regulator) in the water.

Miyashita et al., Column 15, line 63 to Column 16, line 6; Column 16, lines 13-16.

Miyashita does not explicitly state what the reductant is. ACS teaches what standard pH regulators (buffers) are available to one of ordinary skill in the art to adjust the pH in water. ACS, Page 95, lines 10-14. ACS explicitly lists oxalic acid (Page 96, Table 3-1, second entry), ascorbic acid (Page 99, line 1), and sodium bisulfite (Page 103, line 1). Sodium bisulfite is another name for sodium formaldehyde sulfoxylate. Thus, ACS teaches four of the five reductants explicitly and teaches the remaining reductant, isoascorbic acid, implicitly.

Because isoascorbic acid is a stereoisomer of ascorbic acid, it performs similarly to ascorbic acid as a reductant in the Fenton reaction. It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute isoascorbic acid for ascorbic acid as a reductant in the Fenton reaction since the two reagents are stereoisomers and would function equivalently in the Miyashita et al. process for cleaning a filtration membrane.

To summarize, Miyashita et al. discloses the claimed invention except for explicitly stating which reductants are used to adjust the pH for the process cleaning reaction run in an aqueous solution. ACS teaches the group of

reductants. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the ACS reductants in the Miyashita et al. process, as taught by ACS, since ACS states at Page 95, lines 10-14 that such a modification would adjust (buffer) the aqueous solution to a given pH.

8. Claims 5-6 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (US Patent No. 6,325,983 B1, Dec. 4, 2001) as applied to claim 1 above, and further in view of Jones (Craig W. Jones, "Applications of Hydrogen Peroxide and Derivatives," published by The Royal Society of Chemistry, Cambridge, UK, 1999). The claims are shown below in italics with the prior art or examiner's comments shown in normal font.

*Claim 5. Process for cleaning a filtration membrane according to claim 1 wherein the peroxide compound is selected from the group consisting of monofunctional peracids, alkali (earth) metal salts of monofunctional peracids, polyfunctional peracids, alkali (earth) metal salts of polyfunctional peracids, organic hydroperoxides, peresters, percarbonates, alkali (earth) metal salts of percarbonates, alkali (earth) metal or ammonium salts of persulfates, and alkali (earth) metal or ammonium salts of perborates.*

Miyashita et al. anticipates all claim 1 limitations and further teaches cleaning the membrane with a detergent comprising a "percarbonate-containing material, such as "peroxomonocarbonate and peroxodicarbonate." Miyashita et al., Column 15, lines 45-49. Furthermore, the percarbonate could be "an alkali metal

salt or an alkali earth metal salt." Miyashita et al., Column 15, lines 49-53. Thus, Miyashita et al. discloses that the peroxide compound in the membrane cleaning process could be a percarbonate or an alkali (earth) metal salt of a percarbonate.

Jones, in his second chapter entitled, "Activation of Hydrogen Peroxide Using Inorganic and Organic Species," teaches that the peroxide group could also be in the form of a monofunctional peracid like peracetic acid or performic acid. Jones, page 61, Section 4, lines 18-22. Jones also teaches "Fenton's Treatment" of waste water and states that the technology dates back to 1894 when Fenton "reported that ferrous ion promoted oxidation of tartaric acid with aqueous hydrogen peroxide." Jones, Page 213, Section 3, lines 1-6. Under these conditions, tartaric acid forms pertartaric acid, which is a polyfunctional peracid. Jones further teaches organic hydroperoxides and peresters on Page 61, Section 4, Lines 1-10, persulfates on Page 219, Section 5, lines 1-6, and sodium perborate on Page 40, Section 3, lines 1-3. Sodium perborate is an alkali metal of perborate. Finally, the ammonium salts of perborate and persulfate are taught by Jones as peroxide options. Quaternary ammonium salts were discussed as cationic phase transfer agents for the activation of hydrogen peroxide in epoxidations (Jones, Page 96, lines 9-13) and olefin hydroxylation (Jones, Page 101, line 15-16 and Page 101, last line to Page 102, line 2). As was discussed above, Jones also disclosed persulfates and perborates. Thus, the peroxide could be the ammonium salt of persulfate or the ammonium salt of perborate. To summarize, Jones teaches that the peroxide could be a monofunctional peracid,

a polyfunctional peracid, an organic hydroperoxide, a perester, an ammonium salt of a persulfate, and an alkali metal or ammonium salt of perborate.

With respect to combining the Miyashita et al. reference with the Jones reference, Miyashita et al. discloses a membrane filtration cleaning method based on a reaction that generates hydroxyl radical ( $\text{OH}^*$ ) using a peroxide compound that could be a percarbonate or an alkali (earth) metal salt of a percarbonate. Jones teaches the same reaction and expands the list of peroxides to include monofunctional peracids, polyfunctional peracids, organic hydroperoxides, peresters, persulfates, and alkali metal salts of perborate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the Jones peroxide compounds for those in the Miyashita et al. membrane cleaning process, as taught by Jones, since Jones states on Page 209, Section 2, lines 1-4, that, "Advanced oxidation processes (AOP's), which involve the *in situ* generation of highly potent chemical oxidants such as the hydroxyl radical ( $\text{OH}^*$ ), have emerged as an important class of technologies for accelerating the oxidation and hence destruction of a wide range of organic contaminants in pollution solids, water and air." The Miyashita et al. method for cleaning waste-water filtration membranes would benefit from having several more peroxide options available as disclosed in Jones.

Finally, there were several peroxides that were alkali (earth) metal salts recited that are unpatentable over Miyashita in view of Jones. Miyashita et al. discloses the peroxide could be "an alkali metal salt or an alkali earth metal salt"



of percarbonate. Miyashita et al., Column 15, lines 49-53. Jones discloses that the peroxide could be a monofunctional peracid, a polyfunctional peracid, a persulfate, or an alkali metal salt of perborate. It would be obvious to one of ordinary skill in the art at the time the invention was made to combine the alkali (earth) metal cation disclosed in Miyashita et al. with the various peroxide anions disclosed in Jones in order to provide the Miyashita et al. method with a wider range of peroxides from which to choose. Thus, Miyashita et al. in view of Jones discloses alkali (earth) metal salts of monofunctional peracids, alkali (earth) metal salts of polyfunctional peracids, alkali (earth) metal salts of persulfates, and alkali (earth) metal of perborates.

To summarize, Miyashita et al. in view of Jones discloses or suggests all claim 5 limitations.

*Claim 6. Process for cleaning a filtration membrane according to claim 5 wherein the peroxide compound is selected from the group consisting of peracetic acid, perpropionic acid, monopersuccinic acid, monoperglutaric acid, acetylacetone peroxide, and magnesium monoperoxyphthalic acid.*

Miyashita et al. in view of Jones discloses or suggests all claim 5 limitations. Jones further teaches peracetic acid as one of the peracids "most relevant to the chemical industry." Jones, Page 61, Section 4, lines 20-22. Perpropionic acid is a homolog of peracetic acid and would be implied by the Jones reference to peracetic acid. The monopersuccinic acid, the monoperglutaric acid, and the

magnesium monoperoxyphthalic acid would be formed *in situ* as an intermediary before proceeding to the hydroxyl radical used to clean the membranes as taught by Miyashita et al. It would be within the ordinary skill of the art at the time the invention was made to generate these compounds given that the Fenton reagent chemistry has been known since 1894. Jones, Page 37, Section 2, lines 3-10 and Page 74, reference 2. Similarly, acetylacetone peroxide is available commercially in a mixture and it would be within the ordinary skill of the art at the time the invention was made to substitute a acetylacetone peroxide mixture for the peracetic acid of Jones in order to generate the hydroxyl radical used to clean the membranes via the known Fenton reaction, as taught by Miyashita et al.

In summary, Miyashita et al. in view of Jones discloses or suggests all claim 6 limitations.

*Claim 10. Process for cleaning a filtration membrane according to claim 2 wherein the activator and/or reductant is intermittently added to the influx.*

*Claim 11. Process for cleaning a filtration membrane according to claim 1 wherein the peroxide compound is intermittently added to the influx.*

Miyashita et al. anticipates claim 1 where a peroxide compound is recited as part of a detergent to clean a filtration membrane. Miyashita further anticipates claim 2 where an activator and a reductant are recited as part of the same detergent. Miyashita et al. further teaches that, "During use, the separating

membranes are cleaned with a solution comprising a detergent," and, "In the cleaning method according to the present invention, a system for bringing separating membranes to be cleaned and detergent into contact with each other is not specially limited as long as it enables the separating membranes and detergent to contact each other sufficiently." Miyashita et al., Column 15, lines 44-45; Column 16, lines 22-26. This last teaching would include the process of intermittently dosing a water-soluble peroxide compound, an activator or a reductant to the influx. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the peroxide, activator, or reductant could be intermittently dosed since it was known in the art that any dosing mechanism would have worked so long as it "enables the separating membranes and detergent to contact each other sufficiently." Miyashita et al., Column 16, lines 22-26. In summary, Miyashita et al. discloses or suggests claims 10 and 11.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is 571-270-3166. The examiner can normally be reached on Monday through Thursday, 8:00 am to 6:00 pm.

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10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA

  
WALTER D. GRIFFIN  
SUPERVISORY PATENT EXAMINER